

supplemented by numerous visits to other alkali-manufacturing districts of Britain and the Continent. The author's present position as professor at a technical high school enables him to state frankly what he knows and what he has seen, since he can expect no benefit from keeping anything back."

Every one who reads the volume before us will feel that Prof. Lunge has admirably succeeded in the serious task which he has set himself to accomplish, and there is no doubt that he has thus not only filled up an important lacuna in our chemical literature—for in no sense can any other existing work on the subject be said to be satisfactory—but he has given us a work which must become a standard one.

The importance and magnitude of the British sulphuric acid trade will best be understood when we remember that cheap glass and cheap soap—or light and cleanliness—depend upon the cheap production of oil of vitriol; and when we learn that Great Britain manufactures about five-eighths of the production of the world, and that the annual amount made in this kingdom now reaches the enormous figure of 832,000 tons.

Nor is it in quantity alone—although that is, after all, the true measure of a successful trade—that the English manufacturers stand pre-eminent. In all the great improvements which have taken place, England has fully held her own with her perhaps more highly-educated Continental rivals. Thus, although the introduction of pyrites in place of brimstone is often accorded to Messrs. Perret of Chessy, in 1835, there is no doubt that Mr. Hill of Deptford patented the process in 1818, whilst the first to employ pyrites on a large scale was Thomas Farmer of London. Passing again to the mechanical devices for burning pyrites, we find that Dr. Lunge gives an unfavourable opinion as to the construction and mode of working of the Continental burners, and acknowledges that the English form is that which yields the best results, and is now being largely introduced in both France and Germany.

Then, again, as regards the construction of the now all-important leaden chamber, we find that an Englishman, Dr. Roebuck of Birmingham, was the first to erect such a chamber in 1746. And if it is to the genius of Gay-Lussac in 1827 that we owe the idea of the recovery of the excess of escaping nitrous fumes, by passing the exit gases through a shower of strong sulphuric acid, we must remember that this part of the manufacture was not perfect until Mr. Glover proposed the addition of his denitrating tower. All these, and many other inventions and appliances made by intelligent English manufacturers, are clearly stated by Dr. Lunge, who appears to be perfectly free from bias, and discusses the whole subject with a thoroughly scientific spirit. Our English system of Government inspection of sulphuric acid works also comes in for a proper share of notice and commendation, although we do not find mention made of the labours of the recent Noxious Vapours Commission, founded upon whose report the Government have brought forward a new Noxious Vapours Act, which is to include a large number of works, especially vitriol works, which as yet are not placed under inspection. Several of the various proposals which have been made by the chief inspector, Dr. Angus Smith, and his staff,

are dwelt upon. Especially we would notice Fletcher's valuable anemometer for the measurement of the draught in flues and chimneys, upon the results of which the escapes of acid are ascertained.

Dr. Lunge has lived so long amongst us that he not only fully appreciates highly our manufacturing skill, but he is able to express his appreciation in terse and luminous English. The illustrations, too, with which the volume teems are of the highest excellence, drawn, as they all appear to be, to scale, and engraved with the care and precision which is characteristic of the great publishing house of Vieweg and Sons of Brunswick. From whatever point of view we consider his labours, there is no doubt that they will be highly valued both by students and manufacturers, and we can confidently recommend this first volume of Dr. Lunge's work to all those who, from the scientific or from the practical side, are interested in this most important chemical manufacture.

H. E. ROSCOE

OUR BOOK SHELF

On the Origin of the Laws of Nature. By Sir Edmund Beckett, Bart. (London: Society for Promoting Christian Knowledge, 1879.)

THIS is a very clever little book, and deserves to be widely read. Its subject, however, is scarcely one for our columns. For it is essentially "apologetic," and its strong point is not so much accurate science as keen and searching logic. It dissects with merciless rigour some of the more sweeping assertions of the modern materialistic schools, reducing them (when that is possible) to plain English so as to make patent their shallow assumptions. When, from the inherent vagueness of a statement, the author finds himself unable to present it in intelligible and simple language, he gives by apt analogy a clear view of its absurdity. He follows out in fact, in his own way, the hint given by a great mathematician (Kirkman) who made the following exquisite translation of a well-known definition:—

"Evolution is a change from an indefinite, incoherent, homogeneity to a definite, coherent, heterogeneity, through continuous differentiations and integrations."

[*Translation into plain English.*] "Evolution is a change from a nohowish, untalkaboutable, all-alikeness, to a somehowish and in-general-talkaboutable not-all-alikeness, by continuous somethingelifications and sticktogetherations."

The following quotations, taken almost at random, give a fair idea of the style of the book:—

"You may say perhaps that this is just Hume's famous argument against miracles, viz. that all experience is against them, while lying is not at all contrary to experience. But that again is a mere paradox, or a verbal trick which either begs the question or is absurd. For if by 'all experience' he meant literally all experience, that simply begs the question; and if he meant only general experience, it sinks into the platitude that miracles are uncommon. Again, if the prevalence of lying were a sufficient reason for disbelieving any extraordinary story, then we must not believe that any extraordinary event ever happened: which is absurd."

"In that respect there is no difference between a single atom and that congeries of atoms which for the time makes up a man: at any rate atheistical philosophers admit none; according to them it is matter (*i.e.* the atoms of it) 'that has the promise and potency of life,' and man is only a machine resulting from their spontaneous action under laws and forces which always existed without any cause. But if the most determined man in

the world resolves ever so firmly to walk to a place a mile off, that initial resolution will never get him there unless he further resolves at every moment of his walk to take the next step, and takes it."

"... Atheistic philosophers are always insisting on the fact that whatever powers have made the world, have made it and kept it going and improving by means of invariable laws or modes of action. Then if uniformity of action of the proper kind can do the business so well, why should it be varied? This argument against a creative will in other words asserts that there can be no such will because the plan and rules by which it uniformly acts are so good that they have never to be varied in order to repair a single defect or produce a single improvement; i.e. 'there is no creator and maintainer of the world because the design was so perfect. If we had seen the universal machine working by fits and starts we should certainly have admitted that every one of them involved a fresh application of power; but we deny any because it works so smoothly that it seems to go of itself, though it is always turning out products of infinite variety, and in some respects continually improving.' Such an argument as that only needs stating nakedly to answer itself. . . . A machine that will go on for ever producing ever-varying and ever-improving results is manifestly and infinitely superior to one that needs continual interference, and implies infinitely greater wisdom in the maker of it."

"... the leaders of the materialistic school give us such dogmatic statements as that 'materialism is the best working hypothesis,' and that 'it is a fundamental law of psychology that all beliefs as to the past and the present must rest on experience.' But they neither pretend to prove that 'fundamental law,' nor to tell us who made it, except themselves, nor why a hypothesis is the best working one which explains nothing, but merely asserts, when turned into plain English, that things are because they are; and that mind is only the result of certain motions of matter, without professing to explain how a single particle of matter came to be able to move itself . . . all this language of the materialists or atheists, or sceptics, or whatever else they call themselves, is not demonstration but mere assertion, which could just as well be made the other way."

When the purposely vague statements of the materialists and agnostics are thus stripped of the tinsel of high-flown and unintelligible language, the eyes of the thoughtless who have accepted them on authority (!) are at last opened, and they are ready to exclaim with Titania

Methinks "I was enamour'd of an ass."

As the touch of Ithuriel's spear at once happily revealed the Deceiver, these frank and clear exposures of the pretensions of pseudo-science cannot fail of producing great ultimate good.

P. G. TAIT

The Home of the Eddas. By Charles G. Warnford Lock. With a Chapter on the Sprengisandr by Dr. C. Le Neve Foster. (London: Sampson Low, Marston, and Co., 1879.)

ANOTHER volume of Icelandic travel has been added to the lengthy series which already loads the book-shelves of those who are interested in that wonderful country of frost, and flood, and fire. More than fifty such works have been published during this century; some discussing the geology, others the natural history of the country; others the characteristics of the people, and of their literature; many are simply records of travel, some are mere clumsily-constructed diaries. We fear we must class the volume before us among the latter. It is a mere diary, and in good sooth the most intolerably dull diary we ever read. We have searched in vain for any new facts, any new views concerning old facts, any local and individual colouring. The author has travelled over old

ground, by the old methods, permeated by the ideas of his predecessors. Let us, however, give him his due. He is a brave man, and a contented man. Never were dangers more pluckily faced; never did a man grumble less under the most trying circumstances. Many men with less perseverance, less hardihood, less indomitable spirit, have made considerable discoveries, achieved great results. He travels twelve or twenty hours at a stretch in mid-winter; he fords foaming torrents; traverses treacherous bogs; crawls all-fours over ice-slopes; puts up with the most miserable accommodation and food, and yet is always cheerful, and always makes the best of things. Often he gets soaked to the skin in a glacier river, and has to sleep in his wet clothes in a pestilential baðstofa. Often after a weary day's march he has to go supperless to bed. That all his labour should have resulted in so little—we fear we must say, in no—gain to art, literature, or science, is quite deplorable. But the fact is, records of Icelandic travel are worn threadbare. More than fifty years ago the works of Mackenzie and Henderson appeared; less than four years ago the two-volumed "Ultima Thule" of Capt. Burton gave us the most recent experiences of an accomplished traveller. For a general description of the country we still prefer Henderson; Baring-Gould's "Scenes and Sagas" furnishes a pleasant, chatty volume of travel, full of north-world lore; while Prof. Bryce's "Impressions of Iceland," in the *Cornhill Magazine* for May, 1874, is the very type of a well-written general article on the subject; full of condensed observation, wide in limit, admirable in style, masterly in treatment. One thing could have partially redeemed "The Home of the Eddas" from its dull monotony: had it been well illustrated with views not commonly met with in Icelandic works of travel, it would have been a redeeming point. But, alas, there is not a single illustration.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Swift's Comet

THE following position of the comet was obtained from three comparisons with the star $Dm + 84^\circ$, No. 60. From a single comparison of the star with *Carrington* 447, the declination of the *Dm* appears to require the correction $-8'$, but I have not applied it to the comet's place. The declination of the ephemeris of the comet, in *NATURE*, vol. xx. p. 248, requires a correction of only $+0'.6$.

1879.	G. M. T.	App. R. A.	App. decl.
	h. m. s.	h. m. s.	h. m. s.
July 10 ...	11 14 12 ...	2 57 37 ...	+84 54 0

1, Vanbrugh Park, Blackheath, S.E.

G. L. TUPMAN

Hissarlik

I SEE in *NATURE*, vol. xx. p. 255, a statement, which has also appeared in the *Times*, that Prof. Virchow has written to my friend, Dr. Schliemann, stating that there is a concurrence of geological opinion in Berlin that all the building stones, fragments of which the professor brought home from Hissarlik, are of fresh-water formation. This conclusion it is said is thought to be decisive against those who affirm the impossibility of identifying Hissarlik with the Homeric Troy on the ground that at the time of the great epic, the site must have been covered by the sea. I am, however, unaware that it has ever been argued that the actual site of Hissarlik was covered by the sea, but only that Hissarlik was probably on the sea-shore, a position which would be quite inconsistent with the statements of Homer. I have never committed myself to this opinion, but I